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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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STAAS & HALSEY LLP
700 11TH STREET, NW
SUITE 500
WASHINGTON, DC 20001

EXAMINER

BELLO, AGUSTIN

ART UNIT PAPER NUMBER

2633

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Please find below and/or attached an Office communication concerning this application or proceeding.

Q.4

Office Action Summary

Application No.

09/272,404

Applicant(s)

MIYATA ET AL.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-20, 22-29, 31-33, 35 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-20, 22-29, 31-33, 35 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7-8, 11-12, 15-17, 19-20, 22, 25-29, 31-33, 35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcuse (U.S. Patent No. 5,608,561) in view of Yoneyama (U.S. Patent No. 5,801,860).

Regarding Claims 1, 11, 12, 22, 26, 27, 31 and 33, Marcuse teaches an apparatus comprising: an optical transmitter transmitting a signal light to a transmission path (Figure 1A), wherein the signal light has a corresponding rise time and fall time (inherent) and the transmitter adjusts at least one of the rise time and fall time (column 3 lines 18-36). Marcuse differs from the claimed invention in that Marcuse fails to specifically teach a receiver receiving the transmitted light through the transmission path wherein changes are made in accordance with characteristics of the signal light received at a receiver. However, one skilled in the art would clearly have recognized that in order to maximize the benefit of the transmitter taught by Marcuse, it would have been beneficial to monitor the transmitted signal at a receiver, using a the information observed at the receiver to make adjustments at the transmitter, thereby allowing the transmitted signal to be optimized for the transmission path. Furthermore, Yoneyama teaches a monitoring and feedback system wherein the transmission of a signal is monitored at a receiver,

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wherein the information obtained is used to make adjustments to the transmitters in the system via a feedback signal to the transmitter (see Figure 5), thereby optimizing the system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to monitor a signal transmitted to a receiver as taught by Yoneyama to maximize the benefit of the transmitter taught by Marcuse by using the information obtained at the receiver to make adjustments to the transmitter in the system via a feedback signal to the transmitter.

Regarding Claim 2, the combination of Marcuse and Yoneyama suggests an apparatus wherein the optical transmitter comprises: an adjusting circuit adjusting said at least one of the rise time and fall time (reference numeral 160 Figure 1B and Figure 2 of Marcuse) in accordance with the characteristics of the signal light at the receiver (as discussed regarding claim 1).

Regarding Claims 3, 16, 28, 35, and 37, the combination of Marcuse and Yoneyama teaches or suggests an apparatus wherein the optical transmitter comprises: a light source emitting a light (reference numeral 120 in Figure 1B of Marcuse); a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time (reference numeral 150 in Figure 1B of Marcuse); an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal (reference numeral 160 in Figure 1B) in accordance with the characteristics of the signal light at the receiver (as discussed regarding claim 1); and a modulator modulating the emitted light with the adjusted electrical modulation signal (reference numeral 130 in Figure 1B), to thereby produce said signal light having at least one of the rise time and fall time of the signal light adjusted (column 3 lines 18-36).

Regarding Claim 4, 5, 7, 17, 19, and 29, Marcuse teaches an apparatus as in claim 1, wherein the transmitter adjusts both the rise time and the fall time (column 3 lines 34-36).

Regarding Claims 8 and 20, the combination of Marcuse and Yoneyama suggests the limitations of claim 1 and 16 including adjusting both the rise time and the fall time of a signal. Marcuse fails to specifically teach making the adjustment in order to maintain amplitude deterioration and phase margin of the transmitted signal light within a specific range. However, making adjustments to the rise and fall time of the signal would have inherently resulted in changes to the amplitude deterioration and phase margin of the signal. Furthermore, one skilled in the art would clearly have recognized that as a result of the inherent effect on a signal observed by adjusting both the rise and fall time of a signal, maintaining the amplitude deterioration and phase margin of the signal within a specified range since could have been accomplished by trial and error in making the adjustment to the transition time is the signal.

Regarding Claim 15, the combination of Marcuse and Yoneyama suggests the claimed invention except for having a plurality of said optical transmitters, each transmitting having a respective signal light having a different wavelength than the signal lights of the other optical transmitters; and an optical multiplexer multiplexing the signal lights together into a wavelength division multiplexed (WDM) signal which is transmitted through the transmission path. It would have been obvious to one of ordinary skill in the art to have replicated the device of Marcuse so that each of the plurality of lasers produced a distinct wavelength, then multiplexing those distinct wavelengths via a wavelength division multiplexer to produce a wavelength division multiplexed signal, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

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Furthermore, Official Notice is taken that multiplexing of a plurality of signals having distinct wavelengths is well known in the art and would have been an obvious improvement to the system of Marcuse for one skilled in the art, thereby allowing one skilled in the art to increase the amount of information transmitted.

Regarding Claims 25 and 32, the combination of Marcuse and Yoneyama teaches a filter filtering the electrical modulation signal, but differs from the claimed invention in that the combination of references fails to specifically teach an electrical amplifier amplifying the electrical modulation signal prior to filtering. However, Official Notice is taken that is well known in the art to amplify a signal prior to filtering it. Furthermore, one skilled in the art would have recognized that by amplifying a signal prior to filtering it, the noise along with the signal would be amplified, thereby making it easier for a filter to filter out the noise and output the desired signal. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have amplified the modulation signal prior to filtering it via an amplifier in order to ease the process of filtering the signal.

3. Claim 6 and 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marcuse in view of Yoneyama and Yamashita (U.S. Patent No. 4,723,312) or Devenport (U.S. Patent No. 6,108,119).

Regarding Claims 6 and 18, the combination of Marcuse and Yoneyama suggests an apparatus as in claims 1 and 16, but differs from the claimed invention in that Marcuse fails to specifically teach that the transmitter lengthens both the rise time and the fall time. However, one skilled in the art would clearly have recognized that one method of lengthening both the rise and fall time of the signal would have been to manipulate the values of the components that

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comprise the filter matching circuit used by Marcuse (reference numeral 160 in Figure 1B and Figure 2). Furthermore, both Yamashita and Devenport teach that manipulation of the components that comprise a filter, the function of which is to adjust both the rise time and the fall time of a signal, can result in an increase in the rise and fall times of an input signal (column 1 lines 45-54 of Yamashita and column 5 lines 60-67 of Devenport). One skilled in the art would have been motivated to increase the rise and fall time of a signal in order to avoid producing a significant overshoot or drop-off of the desired bias level of the laser. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have manipulated the components that comprise a filter taught by Marcuse as taught by Devenport and Yamashita to achieve a lengthening of both the rise and fall time of the signal, thereby avoiding producing a significant overshoot or drop-off of the desired bias level of the laser.

4. Claims 13, 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcuse in view of Yoneyama and Chraplyvy (U.S. Patent No. 5,420,868).

Regarding Claim 13 and 23, the combination of Marcuse and Yoneyama teaches or suggests the limitation of claims 3 and 16, but differs from the claimed invention in that it fails to specifically teach that the modulator modulates the emitted light via one of the group consisting of optical phase modulation and optical frequency modulation. However, such modulation techniques are extremely well known in the art and would have been obvious to one skilled in the art, being that Marcuse teaches modulation of an optical signal. Furthermore, Chraplyvy teaches that it is well known in the art to use phase modulation in a system that modifies a modulation signal (see Figure 1). Therefore, it would have been obvious to one skilled in the art

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at the time the invention was made to have modulated the signal emitted by the device of Marcuse according the phase modulation techniques taught by Chraplyvy.

Regarding Claims 14 and 24, Chraplyvy also teaches a dispersion compensator compensating for wavelength dispersion characteristics of the transmission path (reference numeral 19 in Figure 2).

Response to Arguments

5. Applicant's arguments filed 4/18/02 have been fully considered but they are not persuasive. The applicant argues that the combination of Marcuse with Yamashita or Devenport fails to meet the limitations of the claimed invention. However, the examiner disagrees. Marcuse teaches decreasing the rise a fall times of signal via a filter matching circuit, the matched filter comprising a simple and well known RC circuit as seen in Figure 2. One skilled in the art would clearly have recognized that the components of the RC circuit could have been selected for lengthening instead of decreasing the rise and fall times of the signals. As evidence that this would have been obvious to one skilled in the art, the examiner notes that both Yamashita and Devenport teach that it is well known to manipulate the values of the resistor and capacitor in order to shape pulses of information. For example, Yamashita teaches that the smaller the values of the resistors, the shorter the fall time (column 1 lines 45-46) while the larger the value of the capacitor the longer the rise and the fall time (see Figure 4). The examiner believes that this would have suggested to one skilled in the art that, if desired, the values of the resistors and capacitors of the system of Marcuse could have purposely been made large in order to increase the rise and fall times of the signal. In other words, one skilled in the art would clearly have recognized that the small resistor and capacitor values would have yielded

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decreased rise and fall times, while large resistor and capacitor values would have yielded increased rise and fall times. Furthermore, Devenport specifically teaches a method for increasing the rise and the fall times of a signal via the incorporation of a large capacitance in the transmitter (column 5 lines 60-63, e.g. "a large capacitor significantly slows the rise and fall times of the signal"). It is clear to the examiner that the teachings of Devenport and Yamashita would have suggested to one skilled in the art that the values of the RC circuit of Marcuse could have been selected to be large if increasing the rise and fall time of a signal where desired.

The applicant also argues that the combination of Marcuse and Yoneyama fails to teach the limitations of the claimed invention in that the combination would have failed to obviate adjusting the rise and/or fall time in accordance with the characteristics of the signal light at the receiver. However, the examiner believes that the teachings of Yoneyama would have suggested to one skilled in the art that it would have been possible to control the transmitter in accordance with the characteristics of the signal light at the receiver. In general Marcuse teaches that the rise and/or fall times of a transmitter can be manipulated via a high-bandwidth driver or filter at the transmitter, while Yoneyama teaches manipulation of a transmitter in accordance with the characteristics of the signal light at the receiver. One skilled in the art would clearly have recognized that it would have been possible to manipulate the rise and/or fall times of a signal in accordance with the characteristics of the signal light at the receiver via the feedback method taught by Yoneyama whereby the feedback signal controls the high-bandwidth driver or filter of the transmitter of Marcuse.

6. In response to applicant's argument that Yoneyama, Yamashita, and Devenport are non-analogous to Marcuse and therefore should not be combined with Marcuse, the test for

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obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

7. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB
June 30, 2002


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600